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Administration**

# **Alternative Energies and America's Security**

**Strategic Implications of Emerging Technologies**

**Annual Strategic Conference**

**Strategic Studies Institute, U.S. Army War  
College**

**April 14-16, 2009**



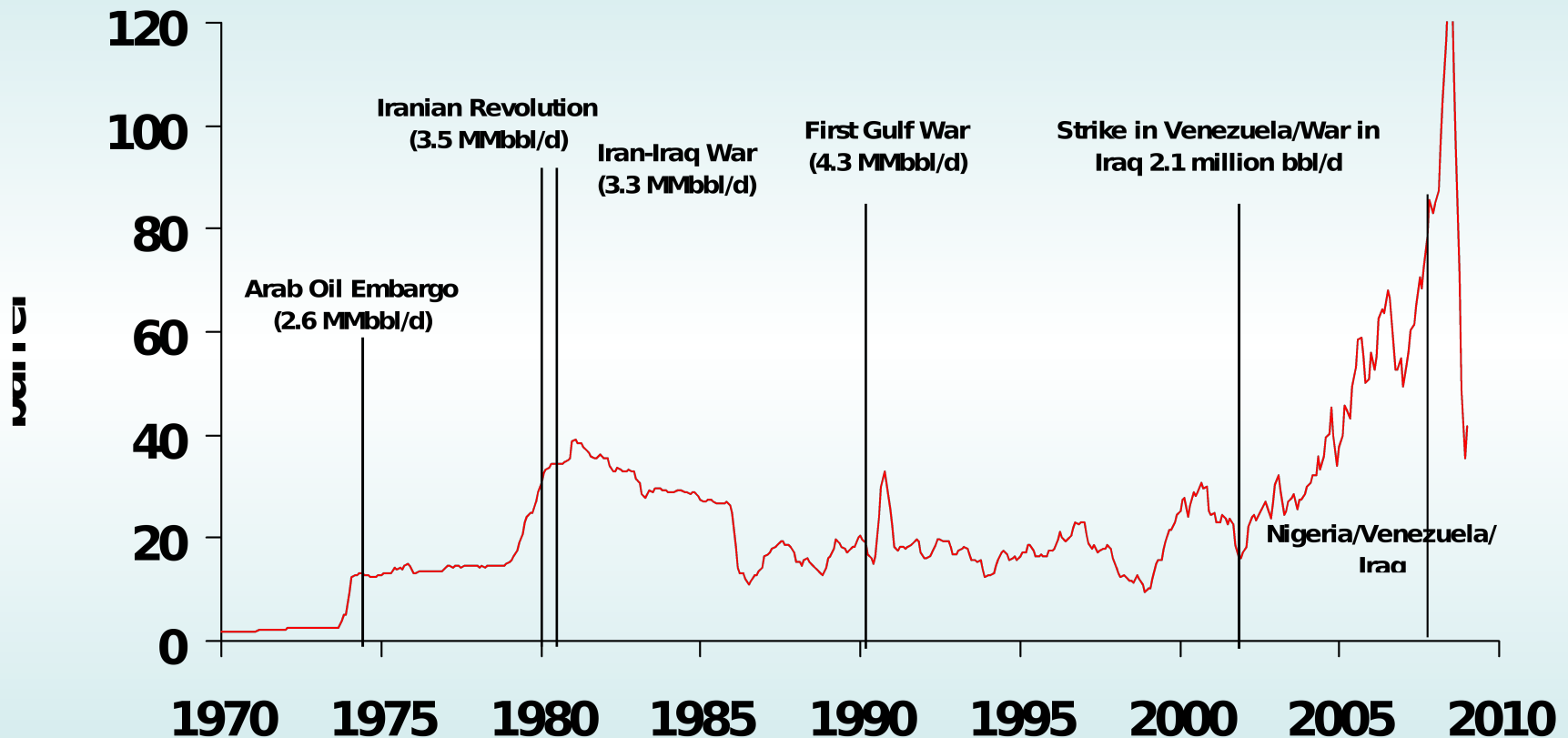
# Energy Security Means Different Things To Different People, Even Within the USG

- In Iraq, energy security could mean having enough hours of electricity during rolling blackouts to avoid social unrest.
- To Belarus, Estonia, Georgia, Latvia, Lithuania, and Ukraine, it means not having their oil or gas supplies cut off by Russia.
- To environmentalists, it could mean reducing greenhouse gas emissions and staving off global warming.
- To many politicians, energy security = energy independence.
- In DOE, it has also meant having a number of reliable, short-haul suppliers. This is one reason Venezuela/Chavez are a concern.
- To others, energy security means affordable gasoline or diesel.

# There Are Many Oil Supply Areas of Concern Worldwide At Any Give Time

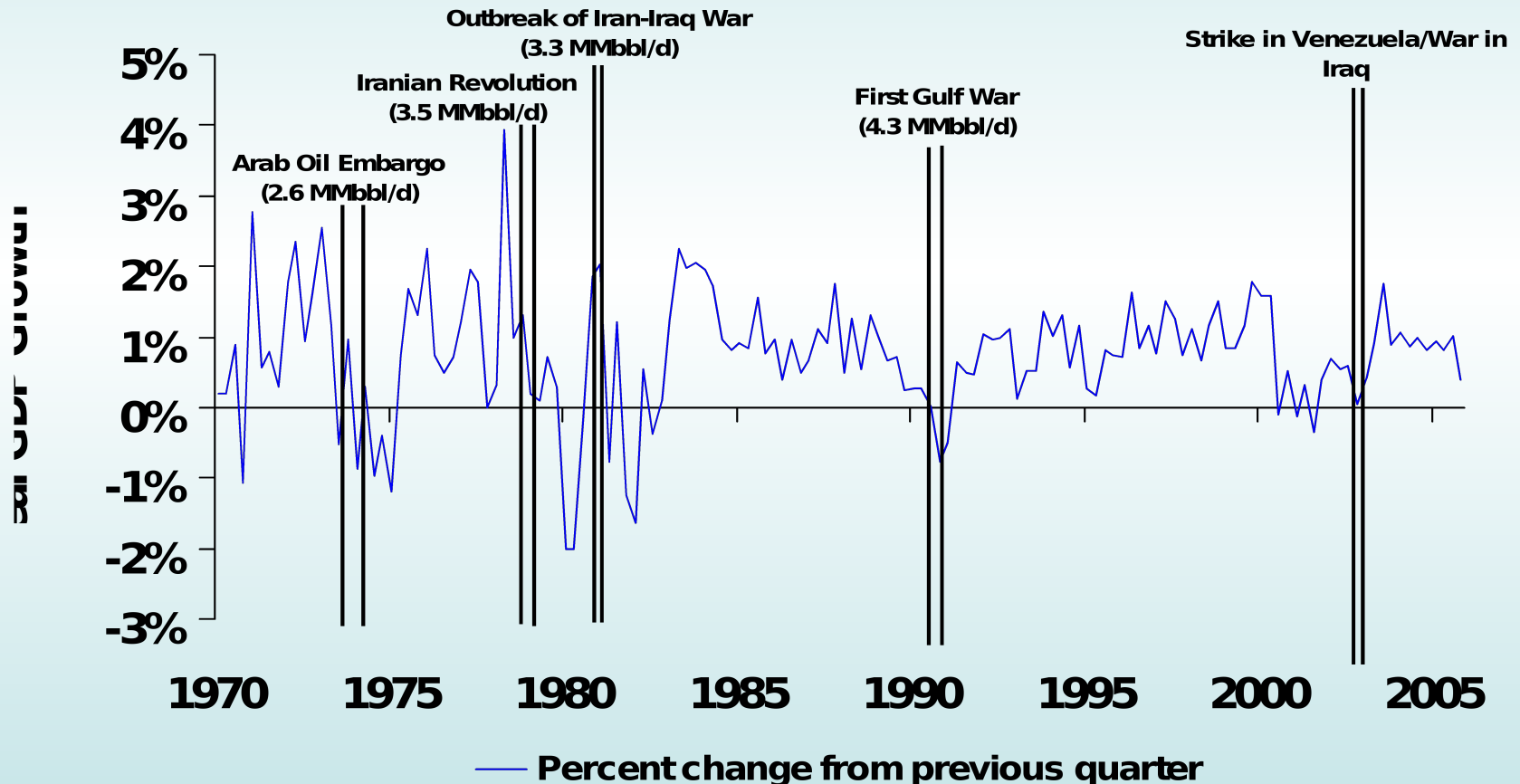


# Supply Disruptions Drove Oil Prices Upwards



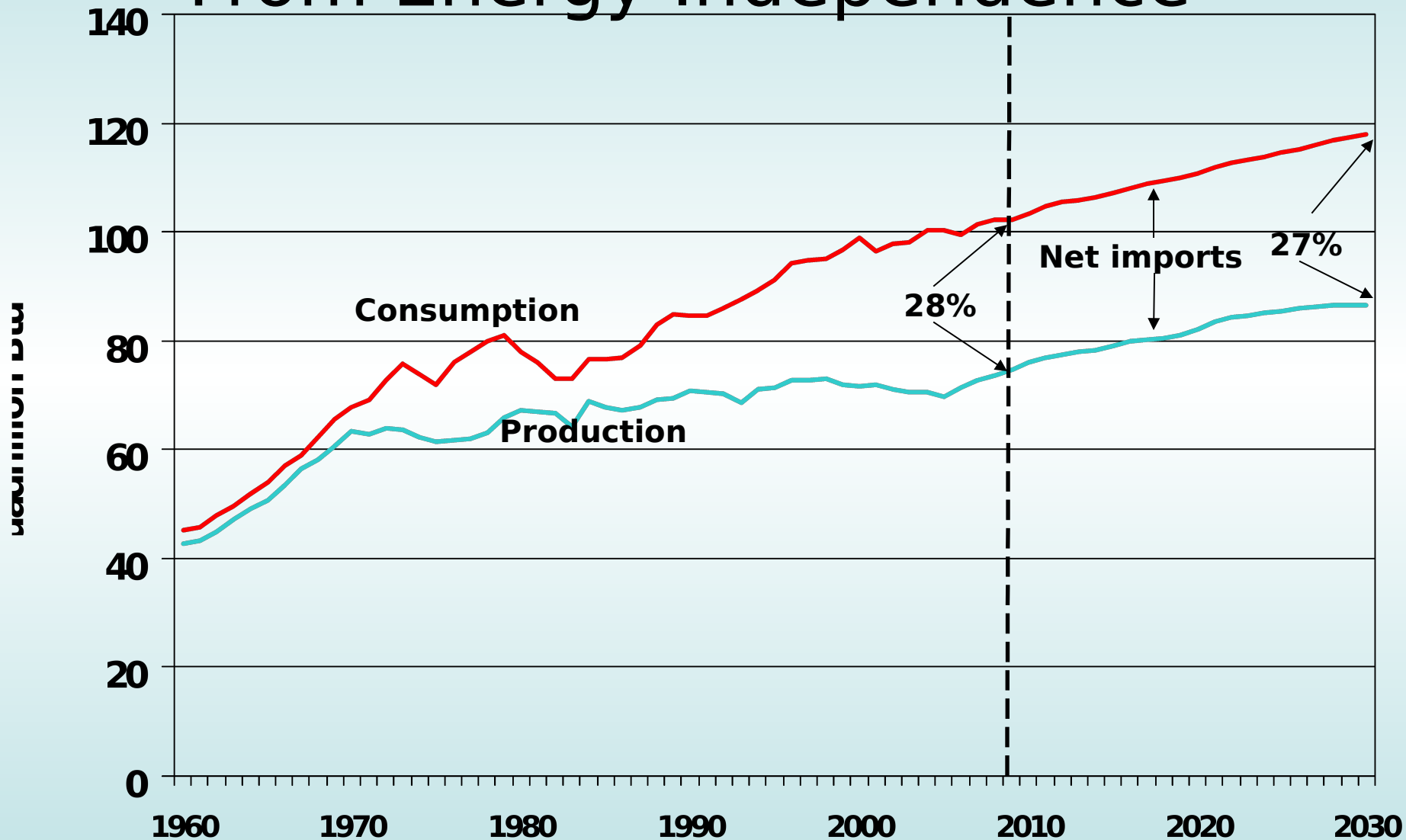
— Refiner Acquisition Cost of Imported Crude Oil (Saudi Light Official Price for 1970-73)

# U.S. GDP Growth Has Fallen After Major Oil Supply Disruptions





# U.S. Energy Security Will Not Come From Energy Independence



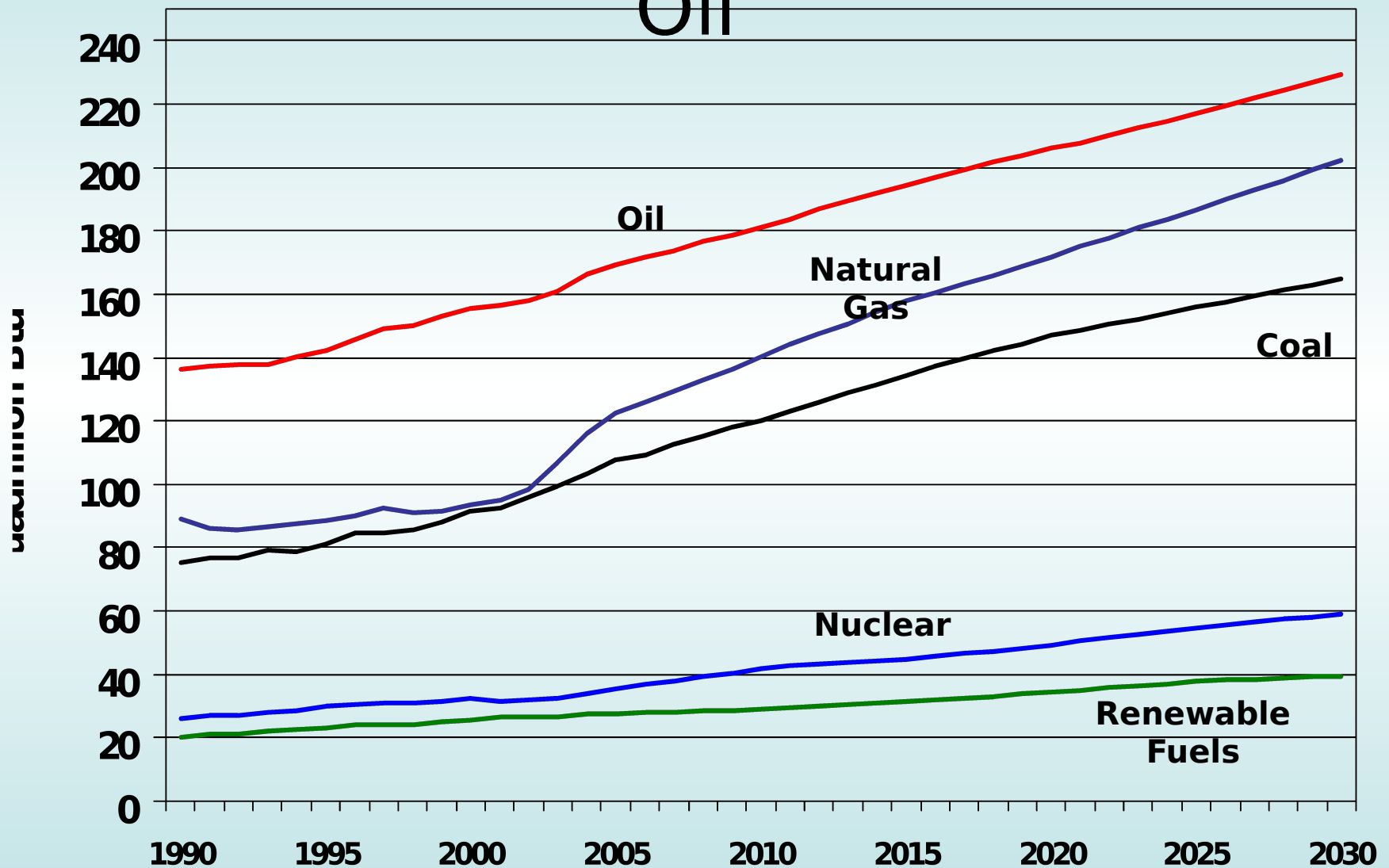
Source: U.S. Energy Information Administration, *Annual Energy Outlook 2008*



# The Cost of U.S. Energy Usage Doubled To Over a \$Trillion In The Last 15 Years

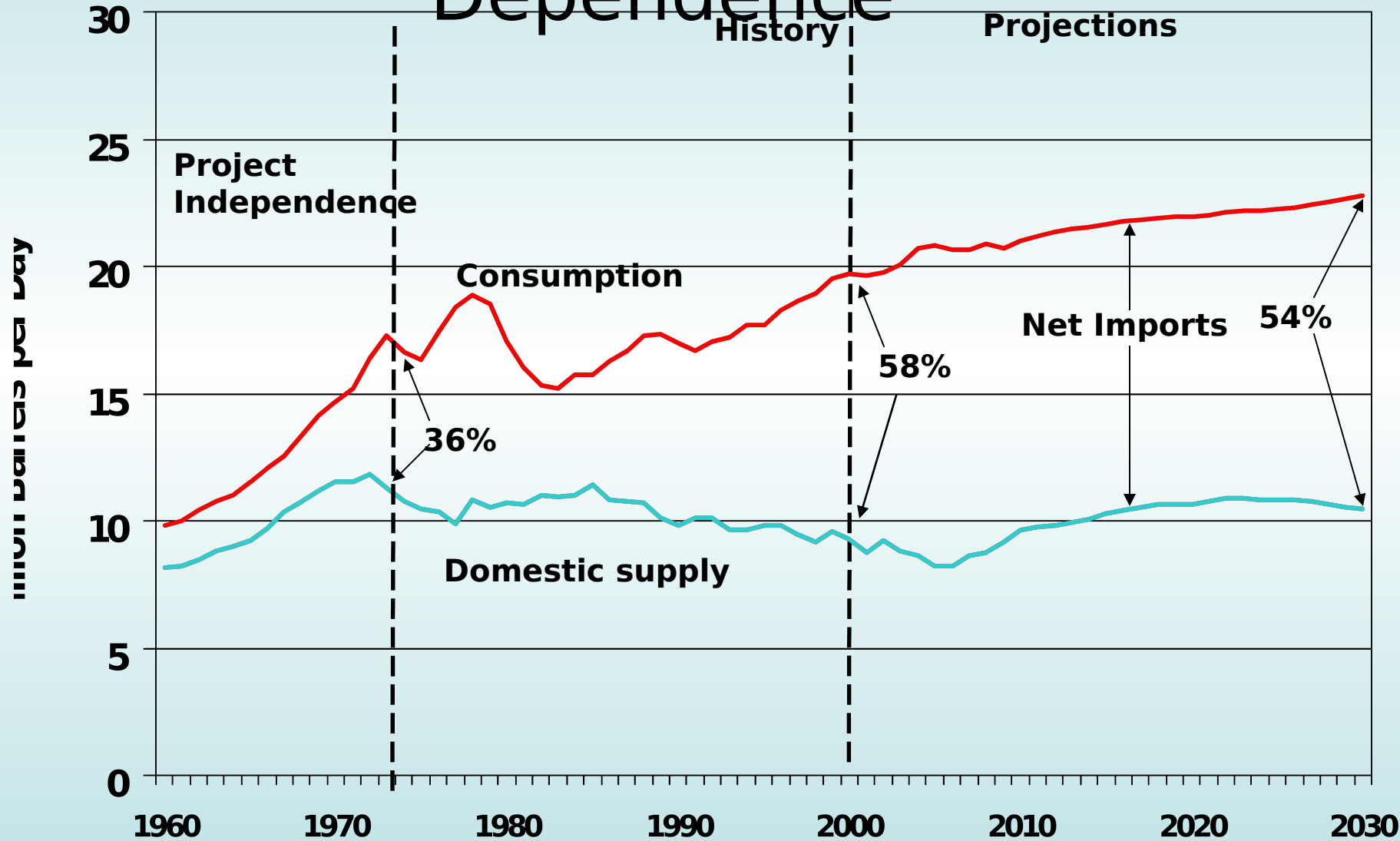


# The World Is Dependent on Oil and Will Continue to be Dependent on Oil





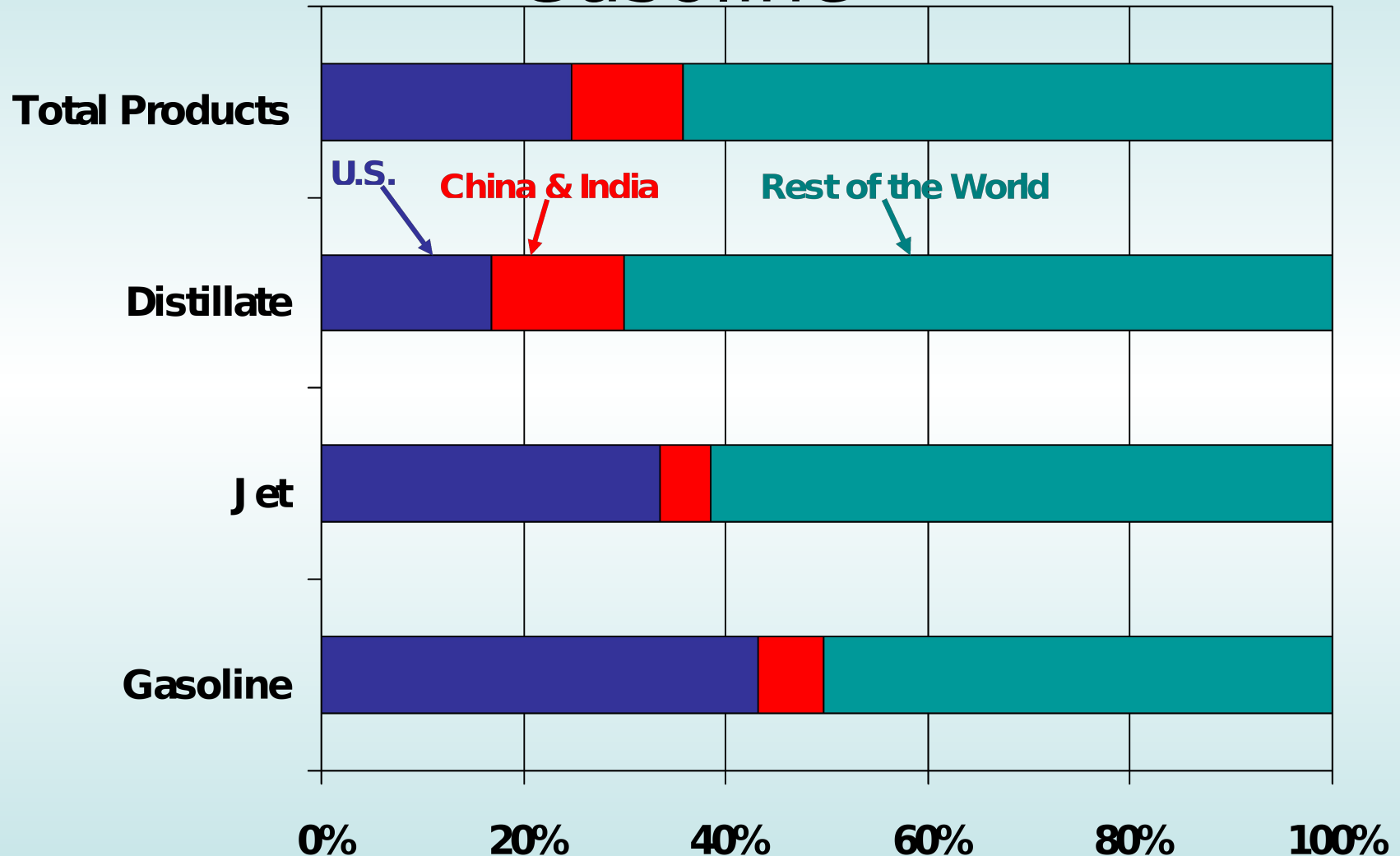
# Despite 30 Years of Trying, the U.S. Has Done Little To Cut Its Oil Dependence



Source: U.S. Energy Information Administration, *Annual Energy Outlook 2008*.

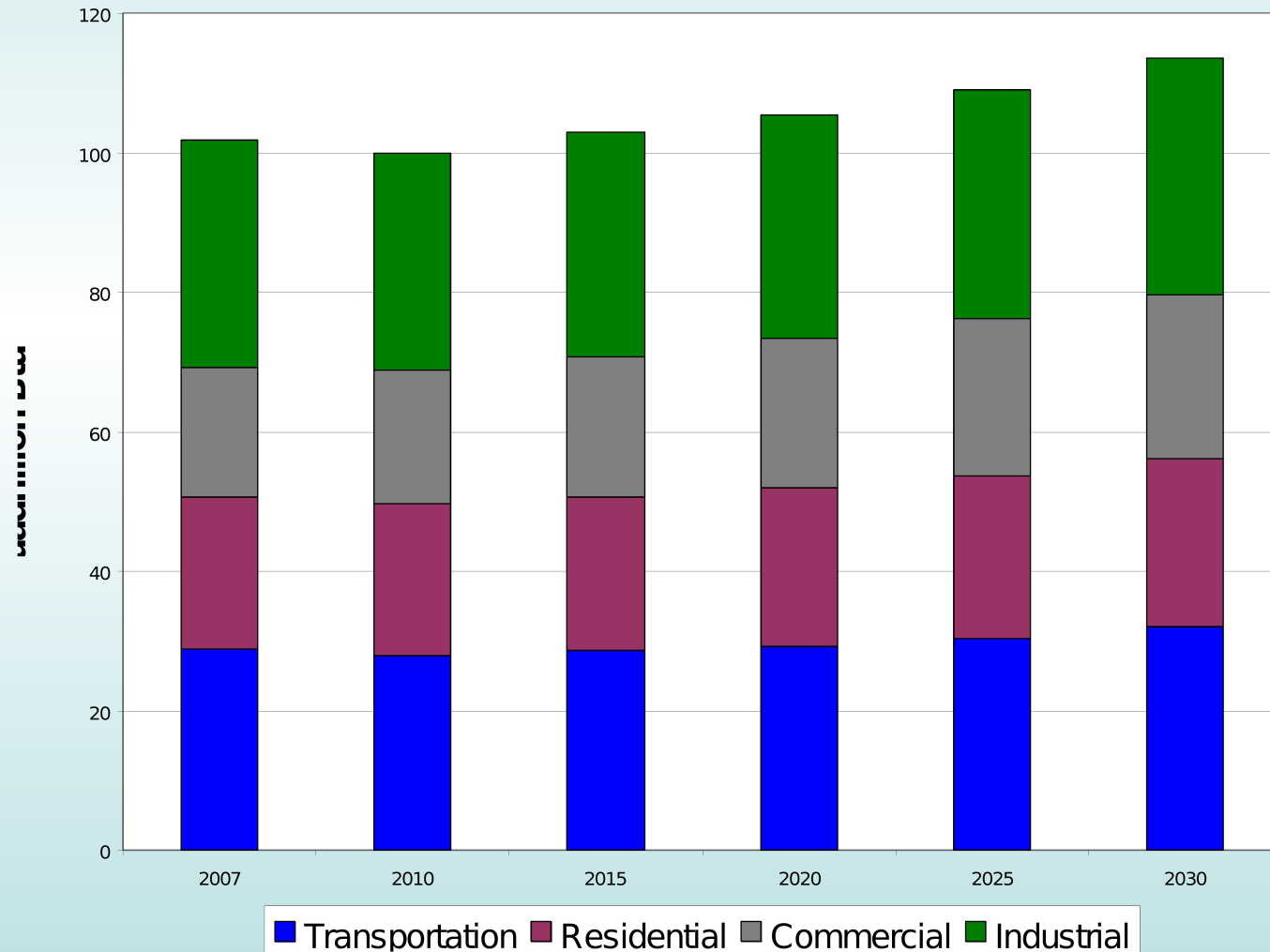


# Transportation is the Reason – The U.S. Consumes 40% of the World's Gasoline

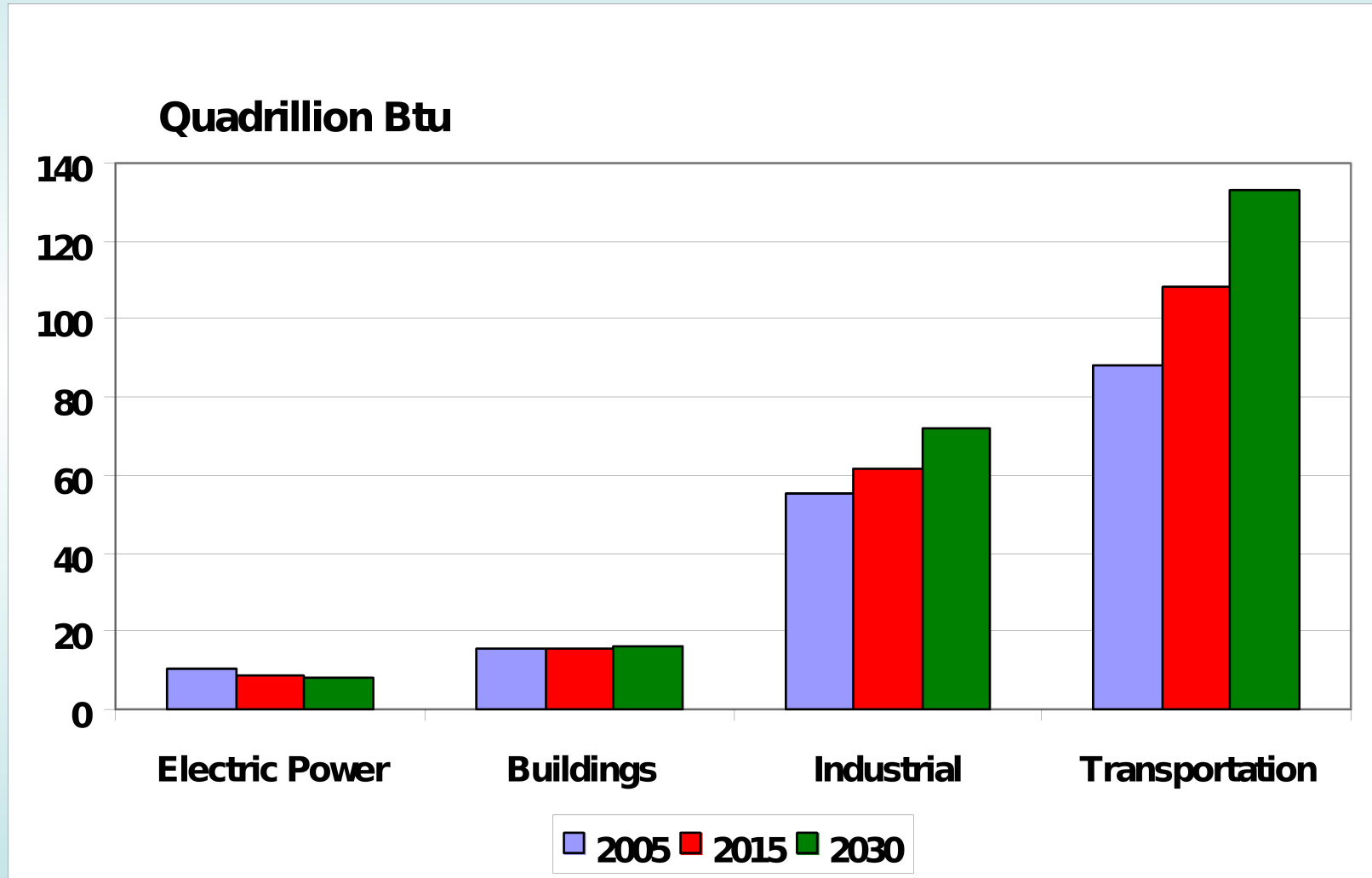


Source: EIA, *International Energy Annual*

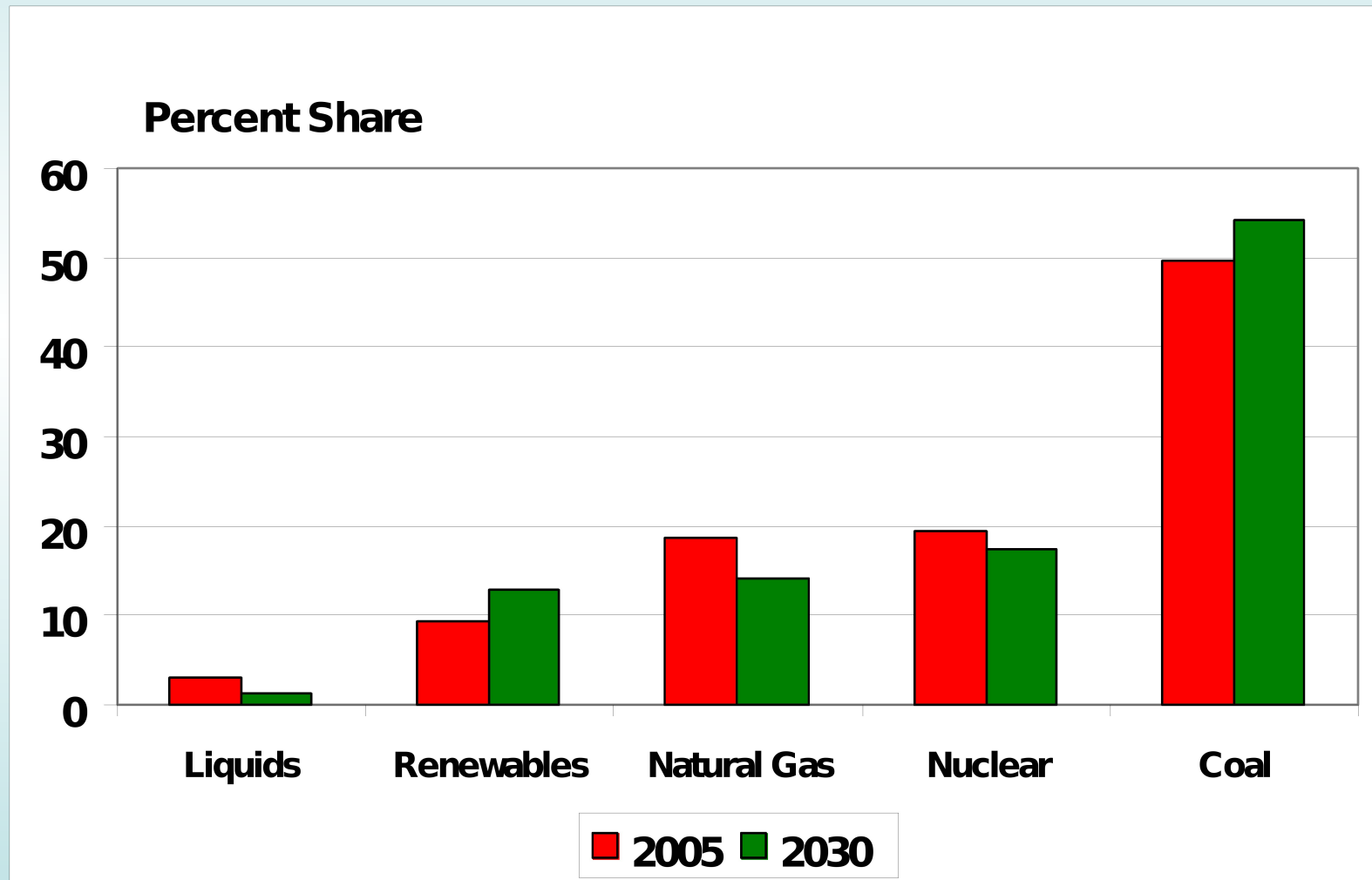
# Transportation and Energy Use for Buildings Dominate US Energy Growth



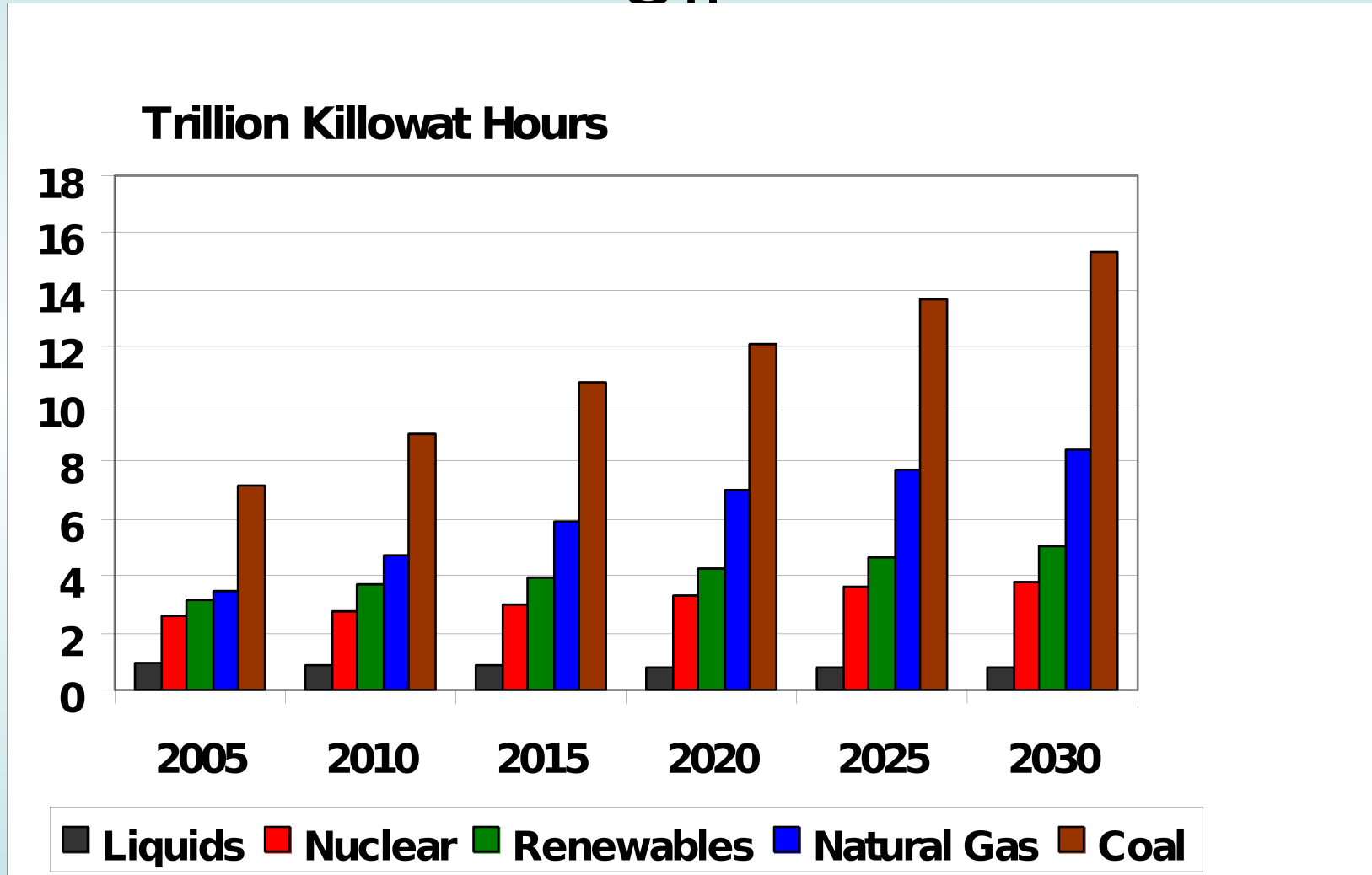
# Global Oil Usage for Transportation Will Continue to Grow



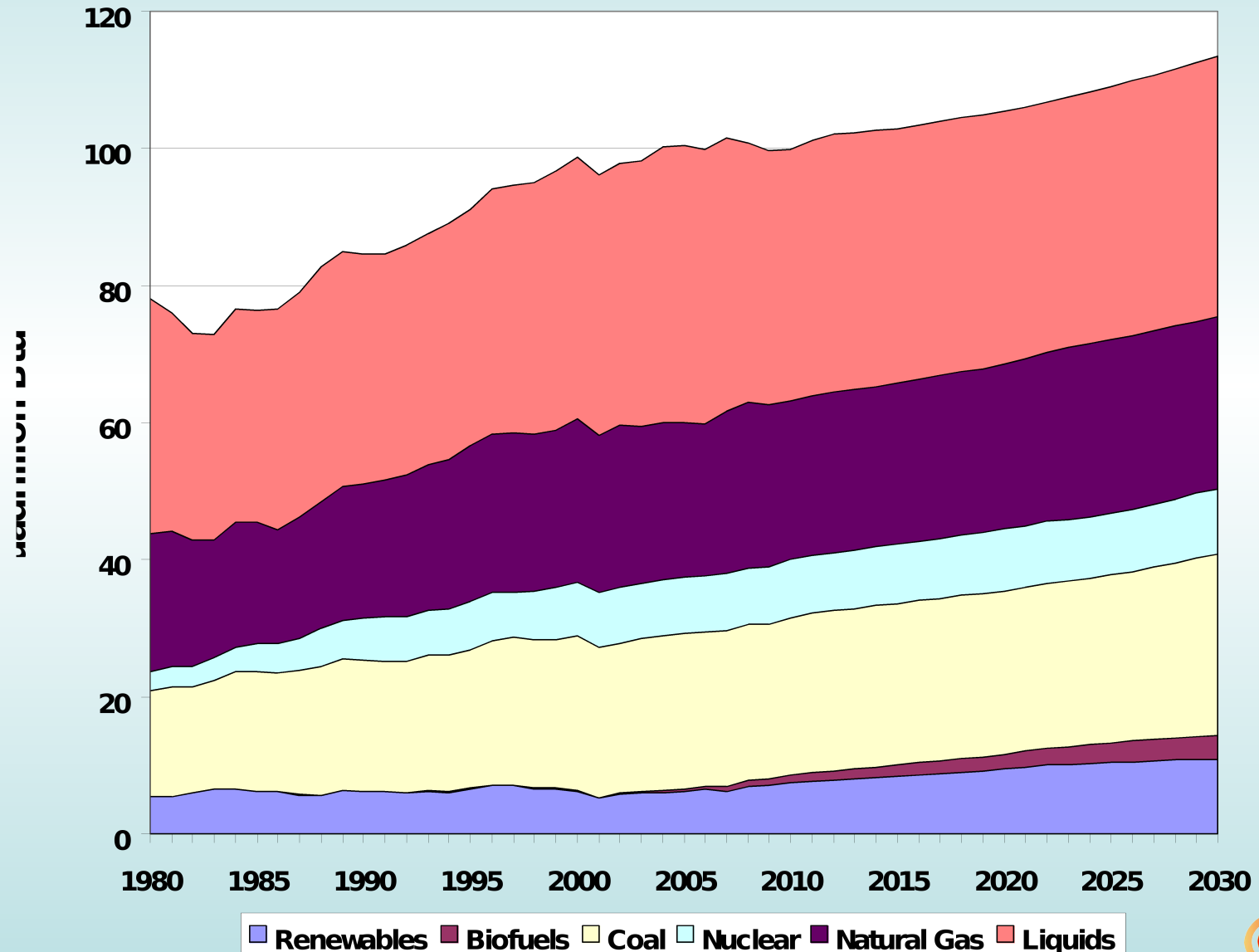
# Even if We Use More Renewables, Coal Will Dominate US Power Generation



# Renewable Usage for Electricity Is Growing Globally but Will Not Displace Oil



# US Renewable Usage Will Increase, But So Will Use of Other Fuels

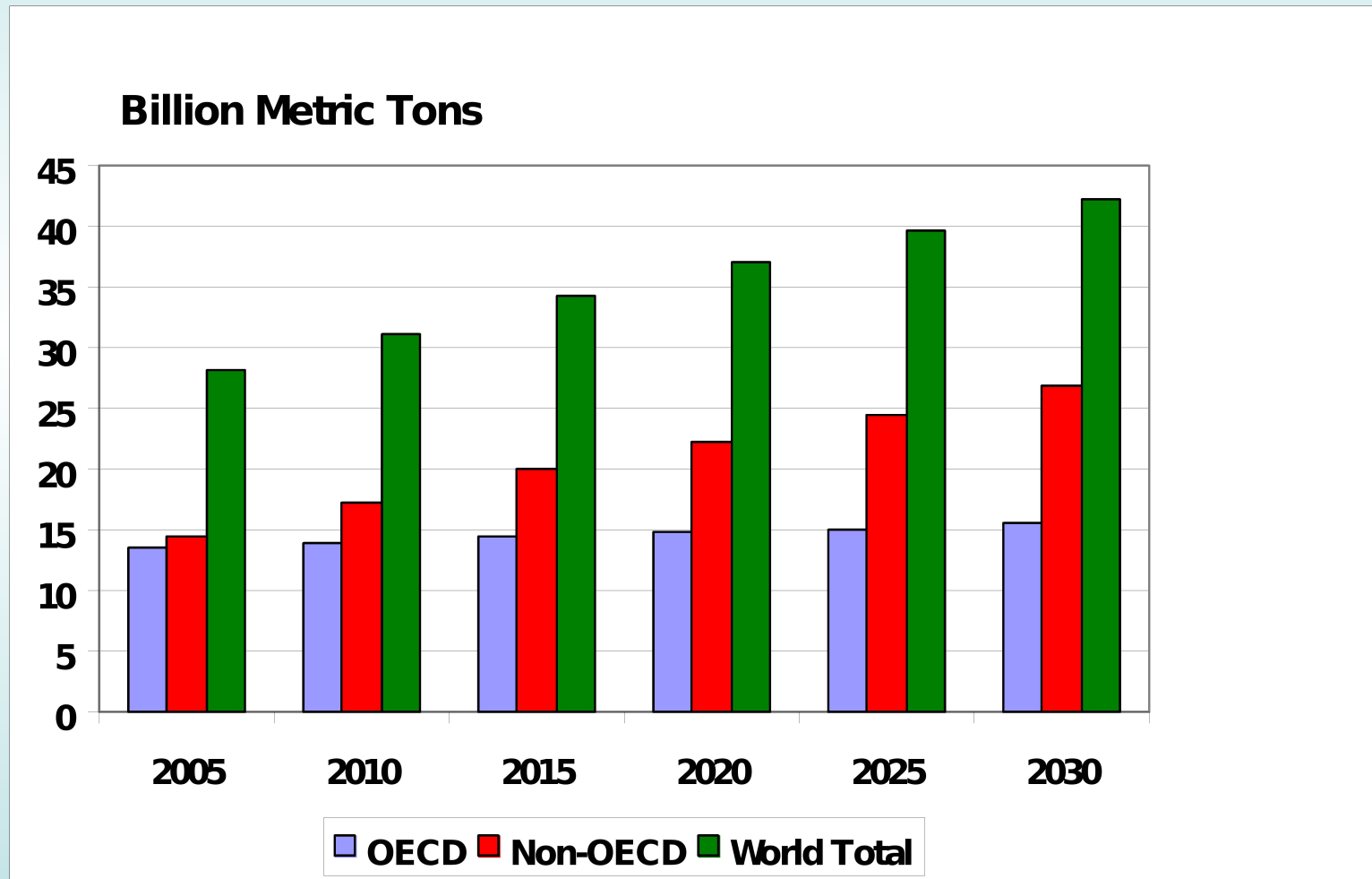




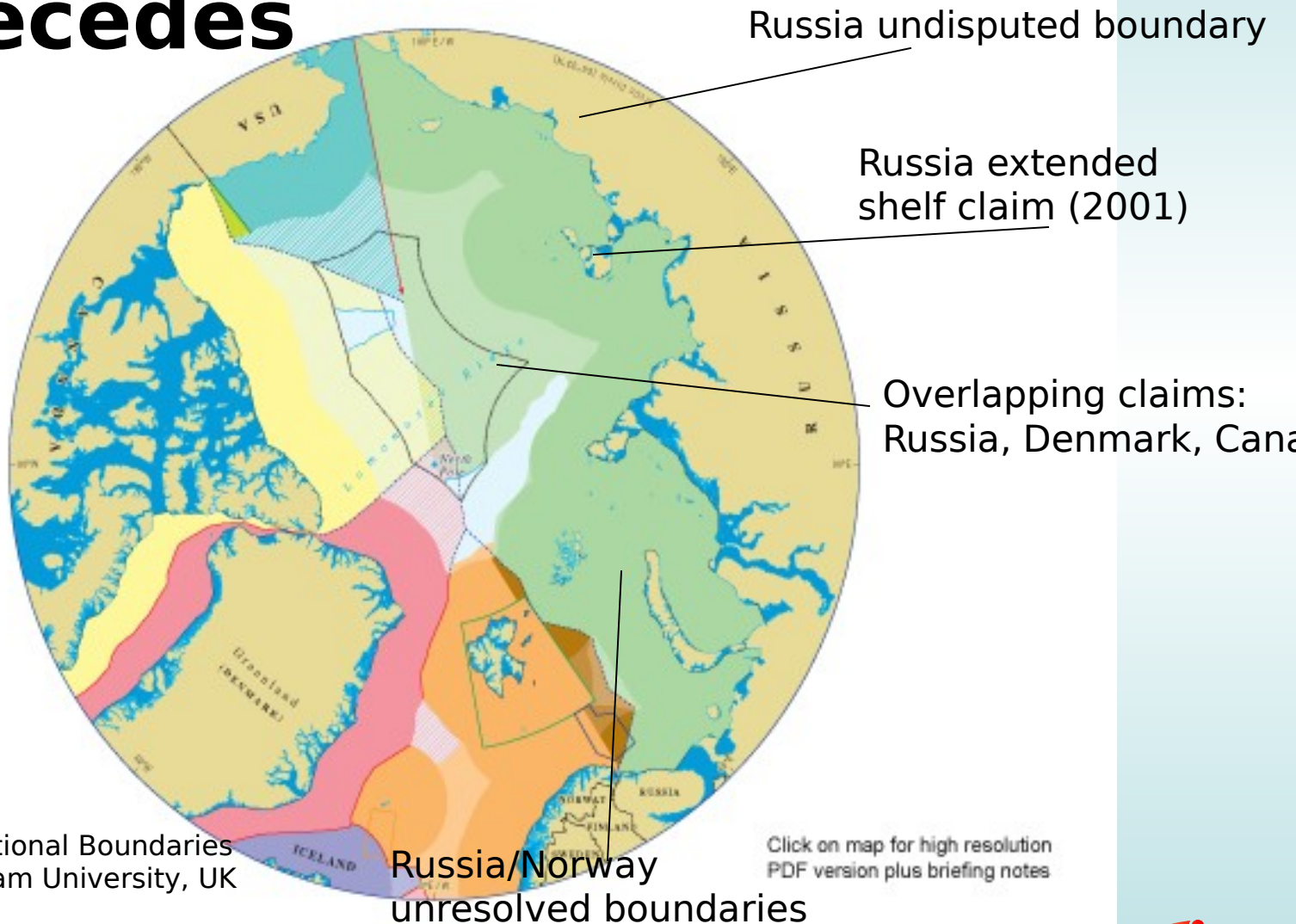
# Renewable Energy Growth - Mostly Hydro Outside the OECD Countries

- In the non-OECD nations, much of the growth in renewable energy consumption is projected to come from mid- to large-scale hydroelectric facilities in Asia and in Central and South America.
- Among the OECD nations, hydroelectricity is fairly well established, and with the exception of Canada and Turkey there are few plans to undertake major hydroelectric power projects in the future.
- Instead, increases in OECD renewable energy consumption are expected to be in the form of nonhydroelectric renewables, especially wind and biomass.
- OECD renewable generation grows by 1.6 percent per year from 2005 to 2030, faster than all the other sources of electricity of generation except natural gas.

# World Energy-Related Carbon Dioxide Emissions Continue to Increase



# Scramble for the Arctic As Polar Ice Cap Recedes



Map Source: International Boundaries Research Unit, Durham University, UK

Click on map for high resolution PDF version plus briefing notes

# Questions?

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